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ABSTRACT

The Strong Interest Inventory (SII) is the most widely used instrument of its type in existence. The inventory is individually administered and can be used with high school students, college students, and adults. It is typically used in vocational counseling. The new 1994 version resembles the original published in 1927 both in the construction of the instrument and in the thorough empirical procedures traditionally employed in its development. Some changes have been made to maintain the contemporary focus and to make the presentation of the information more accessible. From a practical point of view, the test booklet and answer sheet are well-organized and attractive, with clear and concise directions. About 40,000 occupational group members met the selection criteria for the 1994 version. The male reference sample numbered 9,484 individuals, while the females numbered 9,467. Validity and reliability are supported through these samples. The new version appears to represent contemporary issues in vocational counseling, and seems to add an emphasis on the usefulness of the SII for exploratory purposes. (Contains 4 references.) (SLD)

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A Review of the Strong Interest Inventory (SII)

1994 Edition - Form T317

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ED 380 514

Paper presented at the annual meeting of the
Southwest Educational Research Association
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Dallas, Texas.

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Title: Strong Interest Inventory (Form T317 of the *Strong Vocational Interest Blanks*)
Authors: Lenore W. Harmon, Jo-Ida C. Hansen, Fred H. Borgen, and Allen L. Hammer
Publisher: Consulting Psychologists Press, Inc. (Stanford University Press)
Date of Publication: 1994
Date of most recent norming sample: 1993
Time required to administer: Approximately 35-40 minutes
Selected costs:

- -- Specimen set (Profile Report includes prepaid combined test booklet and answer sheet, Snapshot and score report) -- (pkg 10 @) -- $57.00
- -- Specimen set (Interpretive Report includes prepaid Profile Report and expanded interpretation) -- (pkg 10 @) -- $85.00
- -- Specimen set (Professional Report includes prepaid Interpretive Report on professional occupations) -- (pkg 10 @) -- $85.00
- -- Computerized adaptive testing version for Microsoft Windows (1 year lease @) -- $150.00 (annual renewal @) -- $50.00
- -- Other Materials: Strong Applications and Technical Guide -- $35.00; Career Exploration: A Journey of Discovery worksheet (pkg 25 @) $14.00

Descnption of Purpose and Nature of Test

The Strong Interest Inventory remains the most widely used instrument of its type in existence today. The inventory is individually administered and can be used with high school students, college students, and adults, and is typically used in vocational counseling. Although not recommended for younger students, counselors can use the *Strong* "as an introduction to the world of work and the process of career choice" (Harmon, Hansen, Borgen, & Hammer, 1994, p. 23).

The SII yields standard scores with a mean of 50 and a standard deviation of 10 for three types of homogeneous sets of scales; the General Occupation Theme Scale (GOT), the Basic Interest Scale (BIS), the Personal Style Scale (PS) and the empirically derived Occupational Scale (OS). All scores are based on combined male and female General Reference Samples (GRS) except for the OS, which yields two sets of standard scores, each derived from same-gender samples.

Most of the eight item categories utilize a Like/Indifferent/Dislike format. However, the Preference Between Two Activities and Preference in the World of Work categories require respondents to choose between two alternatives, and the category entitled Your Characteristics requires responses in a Yes/?/No format.

Description of Revisions

The new 1994 version of the Strong Interest Inventory still resembles the original version published by E.K. Strong in 1927, both in the construction of the instrument itself and in the thorough empirical procedures traditionally employed by all professionals involved with its development. However, it contains some major changes at several levels which the developers suggest were made for two reasons: "(1) to maintain the contemporary focus of the *Strong*, complete with the latest information from some of the fastest growing and evolving occupations; and (2) to enhance use of the information by making the presentation more accessible" (Harmon, et al., 1994, p. 22).

The 1994 revision contains a total of 317 items; 282 are items identical to or slightly modified items from the 1985 *Strong* and 35 are completely new items. Changes at the item level include the alteration of some item names to improve language usage (e.g., "Personnel Director" changed to "Human Resources Director"), contemporary modifications to the retained items which reflect the same content (e.g., "Being married to a research scientist vs. Being married to a sales executive" changed to "Being friends with a research scientist vs. Being friends with a sales executive"), and the addition of new items which contribute to content areas of the various scales (e.g., "Computer Science" added to "School Subjects"). Six of the new items are included under a new section entitled "Preference in the World of Work" and are designed to measure work dimensions.

The male General Reference Sample and the female General Reference Sample have replaced the Men-in-General and the Women-in-General groups inventoried for previous versions of the SII. "Whereas previous comparison groups used people inventoried in earlier years, the 1994 GRSs were made up completely of respondents from the 1990s" (Harmon, et al., 1994, p. 11). The rationale underlying the development of the new female and male GRSs was based on the availability of large-capacity computers which allowed for the increase in the number of people comprising each GRS, and the incorporation of contemporary interests. The female GRS is comprised of 9,467 women and the male GRS by 9,484 men, compared to 300 in each group in previous versions.

The General Occupation Themes (GOT), based on Holland's theoretical construct., "...have been changed somewhat to enhance reliability, and in some cases the scales are longer. However, their item content matches that of the previous scales in order to maintain content and construct validity. As a result, the scales can be interpreted just as were the scales on the 1985 *Strong*" (Harmon, et al., 1994, p. 11). Two theme changes of note include Athletics, changed from Social to Realistic, and Medical Service, changed from Investigative to Social.

The Basic Interest Scales (BIS) remain similar to those on the 1985 *Strong*. However, factor analysis has guided the increase in their numbers from 23 to 25. Under the Artistic GOT, Applied Arts and Culinary Arts have been added, and Computer Activities and Data Management have been added to the Conventional GOT. The Domestic Arts BIS was dropped altogether and the Adventure BIS (renamed Risk Taking / Adventure) has been moved to the new Personal Style Scales. To provide a better representation of content, two of the BISs have been renamed ("Business Management" changed to "Organizational Management" and "Offices Practices" changed to "Office Services").

The 211 Occupational Scales (OS) have also undergone some significant changes, with the 14 new occupations representing contemporary changes in growth and future opportunities in the world of work. All new occupations are represented by the combined GRSs except for Plumber and Child Care Provider. Some occupations have been combined to eliminate the amount of overlap in previously existing scales (e.g., military occupations), six occupations have been renamed to provide the user with a more contemporary idea of the nature of the occupation (e.g., "Recreation Leader" changed to "Parks and Recreation Coordinator"), and four occupations (Bus Driver, Chamber of Commerce Executive, Funeral Director, IRS Agent) have been deleted from the inventory altogether. "The largest difference between the 1985 and 1994 *Strong* is in the length of the scales, with the average being 55 items for the 1985 OSs and 46 for the 1994 OSs" (Harmon, et al., p. 121).

The Personal Style Scales (PS) are a new category of scales which bear some resemblance to the deleted Academic Comfort and Introversion / Extroversion Special Scales, however, do not replace them directly. The Work Style Scale is designed to differentiate between those who

like to work with people and those who prefer to work with ideas, things, or data. The Learning Environment Scale differentiates between those with high levels of formal education and those with more practical experience than formal education. The Leadership Style Scale is designed to reflect whether or not a person prefers to perform tasks individually or whether that individual prefers to motivate others, and take charge of the working environment. The Risk Taking / Adventure Scale (formerly the Adventure BIS) reflects an individual's style of work rather than his or her interest in a particular type of work, hence the change in the item.

Some minor changes have been made in the Administrative Indexes. These include a decrease in the total responses required for an accurate interpretation (from 305 to 300), and a change in the way the total Like/Indifferent/Dislike percentages are computed.

The presentation of information in the Profile has been changed to include a single page called the "Snapshot", which contains an individual's scores on the GOTs, BISs, and OSs with a reference to his or her Personal Style Scale. The BISs remain categorized under the GOTs and the OS scores are reported on separate pages. The number of interpretive comments have been reduced from seven to five and correspond to plotted scores on the box-and-whisker graphs for each gender. Additional changes have been made to the Profile to enhance interpretation and understanding through better presentation of the material, one of the goals for revising the *Strong* in 1994.

Practical Evaluation

The combined test booklet and answer sheet is well organized and attractive. It contains appropriate information that can be discussed in order to establish rapport, and the directions are clear and concise. Editorial content is of exceptional quality and the general presentation of each section enhances face validity. The addition of the "Snapshot" within the Profile and the revisions of the subsequent Profile pages provide test users with a means for more clearly understanding the nature of their scores. The Profile is colorful, represents scores and their significance in a variety of ways, and provides the user with expanded explanation of the scales and how they can be applied to the world of work.

The 1994 version continues to be an easily administered inventory requiring little or no prior training. However, the authors suggest that "...counselors must understand the material presented in this guide and know when to consult it, have the skills necessary to interpret the patterns of scores on the Profile, be able to communicate those interpretations to the client, and know the limits of the inventory" (Harmon, et al., 1994, p. 182). In addition, machine scoring is still required for interpreting scores and obtaining the Profile.

The computerized version of the 1994 *Strong* is only available for the Microsoft Windows environment and three options are available for administration.

Technical Evaluation

Approximately 55,000 individuals representing 98 occupations responded to the original research forms, and from these individuals, approximately 40,000 occupational group members met the selection criteria for the 1994 version. One of the desired outcomes was to ensure that the occupational groups were equally represented in the GRS, therefore 200 representatives from occupational groups which contained more than 200 respondents were randomly selected from the original sample. All members were used for five occupational groups (school administrators, recreation coordinators, small business owners, male and female parks and recreation coordinators) because these groups consisted of less than 200 representatives. However, three of the five groups were represented by at least 175 members and two groups were represented by at least 190 members. The male GRS numbered 9,484 individuals with an average age of 44.6 years and 18.2 years experience in the occupation. The female GRS was comprised of 9,467 individuals with an average age of 40.5 years and 13.8 years experience in the occupation. Additional demographic characteristics include a modal educational level of bachelor's degree for both males and females and approximately 8 percent non-white respondents in each GRS.

Four samples, one constructed of adults retested over a 3-6 month interval and three constructed of college students tested over 1-3 month intervals, were used for the reliability studies. Each GOT yielded test-retest correlations of .74 to .92 which compared favorably with

the typical test-retest correlations of .81 reported for the 1985 *Strong*. In addition, Cronbach's alpha coefficients were increased to .90 or better for all six of the GOTs. "Because the 1994 BISs that have been retained are so highly correlated with the earlier versions, it can be expected that the results of studies of the earlier versions of the scales also generalize to the 1994 scales" (Harmon, et al., p. 84). However, some alpha coefficients have changed slightly due to the elimination of items not highly correlated with the remaining items in each BIS and due to the addition of some items with similar content. For the Occupational Scales, median correlations for the four samples were found to be .90, .87, .85, and .84 respectively. The test-retest correlations for the adults tested over the 3-6 month interval were comparable to the those reported over a 30 day period for the OSs on the 1985 *Strong* .In addition, test-retest reliability for the new Personal Style scales ranged from .81 to .92, with alpha coefficients ranging from .78 - .91. Generally, test-retest and internal consistency correlations from the four samples indicated considerable reliability for all scales over the six month period.

The new correlations arranged in Holland's theoretical hexagon suggest the same pattern of construct validity among the GOTs, although the coefficients vary to some degree. Content validity for the BISs is reflected in the items which focus on a particular content area, although there is no single index for this scale. The 21 retained Basic Interest Scales remained highly correlated with the 1985 *Strong* and yielded a median correlation of .99. Concurrent validation for the Occupational Scales was found using the "Tilton percent overlap" method between the occupational groups and the GRSs. The median percent overlap was 36% for both females and males, an increase of 2% from the 1985 version, and the percentages varied widely, from 15 to 61 percent, which suggests no significant change in the variation of concurrent validity for the 1994 OSs. The highest validities continued to represent those occupations which were concisely defined and relatively distinct from other occupations. For example, the overlaps for male Medical Illustrator and female Athletic Trainer were 15 and 17 percent respectively. In addition, low concurrent validities of approximately 60% were found for occupations which were not well defined, such as female Small Business Owner and male Audiologist .

Extensive studies have been conducted using earlier versions of the *Strong* to examine its predictive validity through hit rates. Although a range of about 20 percentage points exists across the various studies, the accumulated empirical results have yielded hit rates of approximately 65 percent for both males and females. For example, research conducted by Spokane (1979) using the 1974 Strong Campbell Interest Inventory (SCII) with college men and women over a 3 1/2 year period yielded excellent to moderate predictive validity for 59 percent of the women and 71 percent of the men. In addition, The 1981 version of the *Strong* was used by Hansen and Swanson (1983) to examine its predictive validity in choosing a college major, and yielded hit rates which were similar to the results in previous studies, "indicating that the *Strong* can be used with confidence for choosing a college major (Harmon, et al., p. 152). Generally, "The finding of these studies is that a substantial relationship exists between high scores on the Occupational Scales and occupation actually entered" (Hansen & Campbell, 1985, p. 23). Predictive validity studies have not been conducted using the 1994 *Strong*, the assumption being that the scales will yield similar results to the findings of previous studies.

Summary Evaluation

The authors suggest that the Applications and Technical Guide (1994) "...replaces both the manual (Hansen & Campbell, 1985) and user's guide (Hansen, 1992) associated with the 1985 *Strong*. This change is intended to convince the reader that the practical applications and technical foundation of the *Strong* go hand in hand..." (Harmon, et al., 1994, p. 9). The information contained in the new manual encompasses years of research and is impressive in describing the traditional empirical procedures which have been employed since the original version. The changes in the 1994 SII appear to represent contemporary issues in vocational counseling, as the manual contains specific chapters which address gender-related issues and the use of the SII with special populations. Also, current researchers seem to be placing emphasis on the usefulness of the SII for exploratory purposes. Randahl, Hansen, and Haverkamp (1993) found that the SII appears to encourage students to "engage in career exploration activities such as reading and discussion" (Harmon, et al., p. 153).

Some legitimate concerns expressed in the review of the 1985 *Strong* by Westbrook and Norton (1994) have not been directly addressed to date, and one of these issues pertains to the ambiguity of scale construction. For example, this reviewer was unable to find the reason why the Athletics BIS was changed from the Social GOT to the Realistic GOT, even after consideration of a factor analysis study conducted by Lapan, Mcgrath, and Kaplan (1990). In addition, the adjustments to the Basic Interest Scales were based on the same conditions cited by Crites (1978), with no new insight as to the relative effectiveness of why particular items were retained, added, or eliminated.

The information contained in the new manual suggests that results from previous versions of the *Strong* have remained considerably stable over time, and that it is reasonable to expect that future studies conducted with the 1994 version will yield similar results. However, the authors continue to stress the importance of the inventory's predictive power in making long-range decisions, and empirical data supporting predictive validity for the 1994 version has not been reported to date. This has significant implications for effective use of the *Strong* with populations other than those described by Jepsen (1991) in the Westbrook and Norton review (1994). Based on previous studies, the SII seems to be most effective when used with character-specific populations. However, suggestions for merely generalizing results from the 1985 version, although reasonable, are not sufficient to clearly assess the effectiveness of the 1994 *Strong*, especially "since over 46 percent of the scales are based on newly collected data" (Harmon, et al., p. 14). Therefore, it is fair to assume that further empirical studies will be conducted to support these generalizations.

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